

What is claimed is:

1. A ceramic honeycomb structure comprising a plurality of through-holes surrounded by partition walls, wherein a thermal expansion coefficient of an outer circumferential wall portion in the ceramic honeycomb structure is larger than a thermal expansion coefficient in a direction of a diameter of an inside partition wall portion in the ceramic honeycomb structure, and stress is applied to the inside partition wall portion from the outer circumferential wall portion.

2. A ceramic honeycomb structures as defined in claim 1, wherein a material for the outer circumferential wall portion of the ceramic honeycomb structure is the same as or different from a material for the ceramic honeycomb structure.

3. A ceramic honeycomb structure as defined in claim 1, wherein a partition wall of the ceramic honeycomb structure has a thickness of less than 0.1mm.

4. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has 62 cells/cm^2 or more.

5. A ceramic honeycomb structure as defined in claim 1, wherein the outer circumferential wall portion is thicker than an inside partition wall portion of the ceramic honeycomb structure.

6. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has an open frontal

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area of 86% or more.

7. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has a bulk density of 0.26g/cm³ or less.